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SEQUENCE LISTING

<110> Anderson, Marilyn, A., Lay, Fung T., Heath, Robyn L.

<120> Plant-derived molecules and genetic sequences encoding same and
uses therefor

<130> 18-01

<140> not yet assigned

<141> 2002-02-08

<150> USSN 60/267,271

<151> 2001-02-08

<160> 61

<170> PatentIn version 3.0

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aaa cca cca tgc aga aaa gct tgt atc agt gag aaa ttt act gat ggt 96
 Lys Pro Pro Cys Arg Lys Ala Cys Ile Ser Glu Lys Phe Thr Asp Gly
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ctc ttt gtt gcc tat gag gtg caa gct aga gaa tgc aaa aca gaa agc	96
Leu Phe Val Ala Tyr Glu Val Gln Ala Arg Glu Cys Lys Thr Glu Ser	
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aac aca ttt cct gga ata tgc att acc aaa cca cca tgc aga aaa gct	144
Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala	
35 40 45	

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20 25 30	

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35 40 45	

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aaa cca cca tgc aga aaa gct tgt atc agt gag aaa ttt act gat ggt 96
 Lys Pro Pro Cys Arg Lys Ala Cys Ile Ser Glu Lys Phe Thr Asp Gly
 20 25 30

cat tgt agc aaa atc ctc aga agg tgc cta tgt act aag cca tgt gtg 144
 His Cys Ser Lys Ile Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys Val
 35 40 45

ttt gat gag aag atg act aaa aca gga gct gaa att ttg gct gag gaa 192
 Phe Asp Glu Lys Met Thr Lys Thr Gly Ala Glu Ile Leu Ala Glu Glu
 50 55 60

gca aaa act ttg gct gca gct ttg ctt gaa gaa gag ata atg gat aac 240
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Lys Pro Pro Cys Arg Lys Ala Cys Ile Ser Glu Lys Phe Thr Asp Gly
 20 25 30

His Cys Ser Lys Ile Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys Val
 35 40 45

Phe Asp Glu Lys Met Thr Lys Thr Gly Ala Glu Ile Leu Ala Glu Glu
 50 55 60

Ala Lys Thr Leu Ala Ala Ala Leu Leu Glu Glu Glu Ile Met Asp Asn
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 1 5 10 15

- vi -

ctc ttt gtt gcc tat gag gtg caa gct aga gaa tgc aaa aca gaa agc 96
 Leu Phe Val Ala Tyr Glu Val Gln Ala Arg Glu Cys Lys Thr Glu Ser
 20 25 30

aac aca ttt cct gga ata tgc att acc aaa cca cca tgc aga aaa gct 144
 Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala
 35 40 45

tgt atc agt gag aaa ttt act gat ggt cat tgt agc aaa atc ctc aga 192
 Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg
 50 55 60

agg tgc cta tgt act aag cca tgt gtg ttt gat gag aag atg act aaa 240
 Arg Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Thr Lys
 65 70 75 80

aca gga gct gaa att ttg gct gag gaa gca aaa act ttg gct gca gct 288
 Thr Gly Ala Glu Ile Leu Ala Glu Glu Ala Lys Thr Leu Ala Ala Ala
 85 90 95

ttg ctt gaa gaa gag ata atg gat aac taa ttagagatta gaagaaatta 338
 Leu Leu Glu Glu Glu Ile Met Asp Asn
 100 105

aggatgcagt atcacacata ataaagtttc taccttttctt aaaagtgtag ctaatgttgt 398

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 20 25 30

Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala
 35 40 45

Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg
 50 55 60

Arg Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Thr Lys
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 20 25 30
 Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala
 35 40 45
 Cys Ile Ser Glu Lys Phe Thr Asp Gly His Cys Ser Lys Leu Leu Arg
 50 55 60
 Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Ile Lys
 65 70 75 80
 Thr Gly Ala Glu Thr Leu Val Glu Glu Ala Lys Thr Leu Ala Ala Ala
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 Leu Leu Glu Glu Glu Ile Met Asp Asn
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 Ser Gln Thr Phe Pro Gly Leu Cys Phe Met Asp Ser Ser Cys Arg Lys
 35 40 45
 Tyr Cys Ile Lys Glu Lys Phe Thr Gly Gly His Cys Ser Lys Leu Gln
 50 55 60

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Arg Lys Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Lys Ile Ser Ser
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Glu Val Lys Ala Thr Leu Gly Glu Glu Ala Lys Thr Leu Ser Glu Val
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Val Leu Glu Glu Glu Ile Met Met Glu
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Thr Cys Glu Ser Gln Ser His Arg Phe Lys Gly Pro Cys Ser Arg Asp
35 40 45

Ser Asn Cys Ala Thr Val Cys Leu Thr Glu Gly Phe Ser Gly Gly Arg
50 55 60

Cys Pro Trp Ile Pro Pro Arg Cys Phe Cys Thr Ser Pro Cys
65 70 75

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20 25 30

Thr Cys Glu Ser Gln Ser His Arg Phe His Gly Thr Cys Val Arg Glu
35 40 45

Ser Asn Cys Ala Ser Val Cys Gln Thr Glu Gly Phe Ile Gly Gly Asn
50 55 60

Cys Arg Ala Phe Arg Arg Arg Cys Phe Cys Thr Arg Asn Cys
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<400> 24

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Ile Phe Val Ala Thr Gly Met Gly Pro Val Thr Val Glu Ala Arg Thr
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Cys Glu Ser Gln Ser His Arg Phe Lys Gly Thr Cys Val Ser Ala Ser
35 40 45

Asn Cys Ala Asn Val Cys His Asn Glu Gly Phe Val Gly Gly Asn Cys
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Arg Gly Phe Arg Arg Arg Cys Phe Cys Thr Arg His Cys
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His Cys Ser Lys Leu Leu Arg Arg Cys Leu Cys Thr Lys Pro Cys
35 40 45

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<400> 26

Gln Ile Cys Lys Ala Pro Ser Gln Thr Phe Pro Gly Leu Cys Phe Met
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Asp Ser Ser Cys Arg Lys Tyr Cys Ile Lys Glu Lys Phe Thr Gly Gly
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His Cys Ser Lys Leu Gln Arg Lys Cys Leu Cys Thr Lys Pro Cys
35 40 45

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<400> 27

Arg His Cys Glu Ser Leu Ser His Arg Phe Lys Gly Pro Cys Thr Arg
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Asp Ser Asn Cys Ala Ser Val Cys Glu Thr Glu Arg Phe Ser Gly Gly
20 25 30

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Asn Cys His Gly Phe Arg Arg Arg Cys Phe Cys Thr Lys Pro Cys
35 40 45

<210> 28
<211> 47
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<400> 28
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Asp His Asn Cys Ala Leu Val Cys Arg Asn Glu Gly Phe Ser Gly Gly
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Arg Cys Lys Gly Phe Arg Arg Arg Cys Phe Cys Thr Arg Ile Cys
35 40 45

<210> 29
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<400> 29
Arg Thr Cys Glu Ser Gln Ser His Arg Phe His Gly Thr Cys Val Arg
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Glu Ser Asn Cys Ala Ser Val Cys Gln Thr Glu Gly Phe Ile Gly Gly
20 25 30

Asn Cys Arg Ala Phe Arg Arg Arg Cys Phe Cys Thr Arg Asn Cys
35 40 45

<210> 30
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Asn Cys Asp Gly Pro Leu Arg Arg Cys Lys Cys Met Arg Arg Cys
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<210> 31
<211> 51
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- Xi -

Asn Asn Asn Ala Cys Arg Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg
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His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr
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Phe Pro Cys
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Asp Ser Asn Cys
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<210> 33
<211> 51
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Gln Lys Leu Cys Glu Arg Pro Ser Gly Thr Trp Ser Gly Val Cys Gly
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Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Asn Leu Glu Lys Ala Arg
20 25 30

His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr
35 40 45

Phe Pro Cys
50

<210> 34
<211> 51
<212> PRT
<213> peptide

<400> 34
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Asn Asn Asn Ala Cys Lys Asn Gln Cys Ile Arg Leu Glu Lys Ala Arg
20 25 30

His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr
35 40 45

Phe Pro Cys
50

- xii -

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 His Gly Ser Cys Asn Tyr Val Phe Pro Ala His Lys Cys Ile Cys Tyr
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 Phe Pro Cys
 50

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 Tyr Phe Pro Cys
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 35 40 45

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<400> 38

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Lys Val Cys Arg Gln Arg Ser Ala Gly Phe Lys Gly Pro Cys Val Ser
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Asp Lys Asn Cys Ala Gln Val Cys Leu Gln Glu Gly Trp Gly Gly Gly
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Asn Cys Asp Gly Pro Phe Arg Arg Cys Lys Cys Ile Arg Gln Cys
35 40 45

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Lys Thr Cys Glu Asn Leu Val Asp Thr Tyr Arg Gly Pro Cys Phe Thr
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Thr Gly Ser Cys Asp Asp His Cys Lys Asn Lys Glu His Leu Leu Ser
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Gly Arg Cys Arg Asp Asp Val Arg Cys Trp Cys Thr Arg Asn Cys
35 40 45

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Arg Val Cys Met Gly Lys Ser Ala Gly Phe Lys Gly Leu Cys Met Arg
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Asp Gln Asn Cys Ala Gln Val Cys Leu Gln Glu Gly Trp Gly Gly Gly
20 25 30

Asn Cys Asp Gly Val Met Arg Gln Cys Lys Cys Ile Arg Gln Cys Trp
35 40 45

<210> 41

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<400> 41

Arg Val Cys Arg Arg Arg Ser Ala Gly Phe Lys Gly Leu Cys Met Ser
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Asp His Asn Cys Ala Gln Val Cys Leu Gln Glu Gly Trp Gly Gly Gly
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Asn Cys Asp Gly Val Ile Arg Gln Cys Lys Cys Ile Arg Gln Cys Trp
35 40 45

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<213> peptide

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Thr Gly His Cys
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<210> 43

<211> 47

<212> PRT

<213> peptide

<400> 43

Arg Val Cys Met Lys Gly Ser Gln His His Ser Phe Pro Cys Ile Ser
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Asp Arg Leu Cys Ser Asn Glu Cys Val Lys Glu Glu Gly Gly Trp Thr
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Ala Gly Tyr Cys His Leu Arg Tyr Cys Arg Cys Gln Lys Ala Cys
35 40 45

<210> 44

<211> 45

<212> PRT

<213> peptide

<400> 44

Asn Thr Cys Glu Asn Leu Ala Gly Ser Tyr Lys Gly Val Cys Phe Gly
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Cys Arg Asp Asp Phe Arg Cys Trp Cys Thr Lys Asn Cys
35 40 45

<210> 45

<211> 50

<212> PRT

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<400> 45

Leu Cys Asn Glu Arg Pro Ser Gln Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15

Thr Ala His Cys Asp Lys Gln Cys Gln Asp Trp Glu Lys Ala Ser His
20 25 30

Gly Ala Cys His Lys Arg Glu Asn His Trp Lys Cys Phe Cys Tyr Phe
35 40 45

Asn Cys
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20 25 30
Gly Gly Ala Cys His Tyr Gln Phe Pro Ser Val Lys Cys Phe Cys Lys
35 40 45
Arg Gln Cys
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<211> 50
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<400> 47
Glu Leu Cys Glu Lys Ala Ser Lys Thr Trp Ser Gly Asn Cys Gly Asn
1 5 10 15
Thr Gly His Cys Asp Asn Gln Cys Lys Ser Trp Glu Gly Ala Ala His
20 25 30
Gly Ala Cys His Val Arg Asn Gly Lys His Met Cys Phe Cys Tyr Phe
35 40 45
Asn Cys
50

<210> 48
<211> 46
<212> PRT
<213> peptide

<400> 48
Asn Thr Cys Glu His Leu Ala Asp Thr Tyr Arg Gly Val Cys Phe Thr
1 5 10 15
Asn Ala Ser Cys Asp Asp His Cys Lys Asn Lys Ala His Leu Ile Ser
20 25 30
Gly Thr Cys His Asp Trp Lys Cys Phe Cys Thr Gln Asn Cys
35 40 45

<210> 49
<211> 49
<212> PRT
<213> peptide

<400> 49

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Asn Leu Cys Glu Arg Ala Ser Leu Thr Trp Thr Gly Asn Cys Gly Asn
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Thr Gly His Cys Asp Thr Gln Cys Arg Asn Trp Glu Ser Ala Lys His
20 25 30
Gly Ala Cys His Lys Arg Gly Asn Trp Lys Cys Phe Cys Tyr Phe Asn
35 40 45

Cys

<210> 50
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<400> 50
Leu Phe Val Ala Tyr Glu Val Gln Ala Arg Glu Cys Ala Arg Glu Ile
1 5 10 15
Phe Thr Gly Leu Cys Ile Thr Asn Pro Gln Cys Arg Lys Ala Cys Ile
20 25 30
Lys Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg Arg Cys
35 40 45
Leu Cys Thr Lys Pro Cys Thr Gly Ala Glu Thr Leu Ala Glu Glu Ala
50 55 60
Thr Thr Leu Ala Ala Ala Leu Leu Glu Glu Glu Ile Met Asp Asn
65 70 75

<210> 51
<211> 105
<212> PRT
<213> peptide

<400> 51
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Leu Phe Val Ala Tyr Asp Val Glu Ala Lys Asp Cys Lys Thr Glu Ser
20 25 30
Asn Thr Phe Pro Gly Ile Cys Ile Thr Lys Pro Pro Cys Arg Lys Ala
35 40 45
Cys Ile Lys Glu Lys Phe Thr Asp Gly His Cys Ser Lys Ile Leu Arg
50 55 60
Arg Cys Leu Cys Thr Lys Pro Cys Val Phe Asp Glu Lys Met Ile Lys
65 70 75 80
Thr Gly Ala Glu Thr Leu Ala Glu Glu Ala Thr Thr Leu Ala Ala Ala
85 90 95
Leu Leu Glu Glu Glu Ile Met Asp Asn

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105

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 20 25 30
 Ser Asn Thr Phe Pro Gly Leu Cys Ile Thr Lys Pro Pro Cys Arg Lys
 35 40 45
 Ala Cys Leu Ser Glu Lys Phe Thr Asp Gly Lys Cys Ser Lys Ile Leu
 50 55 60
 Arg Arg Cys Ile Cys Tyr Lys Pro Cys Val Phe Asp Gly Lys Met Ile
 65 70 75 80
 Gln Thr Gly Ala Glu Asn Leu Ala Glu Glu Ala Glu Thr Leu Ala Ala
 85 90 95
 Ala Leu Leu Glu Glu Glu Met Met Asp Asn
 100 105

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 20 25 30
 Arg Cys Pro Trp Ile Pro Pro Arg Cys Phe Cys Thr Ser Pro Cys
 35 40 45

<210> 54
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<400> 54
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Glu Ser Asn

<210> 55
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<212> PRT
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<400> 55
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 20 25 30
 Asn Cys Arg Gly Phe Arg Arg Arg Cys Phe Cys Thr Arg His Cys
 35 40 45

<210> 56
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<220>
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 Pro Arg Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys
 20 25 30
 gca ggc acg aag ggt tgt aag tac ttc agt gat gat gga act ttt gtt 144
 Ala Gly Thr Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val
 35 40 45
 tgt gaa gga gag tct gat cct aga aat cca aag gct tgt acc tta aac 192
 Cys Glu Gly Glu Ser Asp Pro Arg Asn Pro Lys Ala Cys Thr Leu Asn
 50 55 60
 tgt gat cca aga att gcc tat gga gtt tgc ccg cgt tca gaa gaa aag 240
 Cys Asp Pro Arg Ile Ala Tyr Gly Val Cys Pro Arg Ser Glu Glu Lys
 65 70 75 80
 aag aat gat cgg ata tgc acc aac tgt tgc gca ggc acg aag ggt tgt 288
 Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Thr Lys Gly Cys
 85 90 95
 aag tac ttc agt gat gat gga act ttt gtt tgt gaa gga gag tct gat 336
 Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp
 100 105 110
 cct aga aat cca aag gct tgt cct cgg aat tgc gat cca aga att gcc 384
 Pro Arg Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Pro Arg Ile Ala
 115 120 125
 tat ggg att tgc cca ctt gca gaa gaa aag aag aat gat cgg ata tgc 432
 Tyr Gly Ile Cys Pro Leu Ala Glu Glu Lys Lys Asn Asp Arg Ile Cys

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130	135	140	
acc aac tgt tgc gca ggc aaa aag ggt tgt aag tac ttt agt gat gat			480
Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp			
145	150	155	160
gga act ttt gtt tgt gaa gga gag tct gat cct aaa aat cca aag gcc			528
Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala			
165	170		175
tgt cct cgg aat tgt gat gga aga att gcc tat ggg att tgc cca ctt			576
Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu			
180	185		190
tca gaa gaa aag aag aat gat cgg ata tgc acc aac tgc tgc gca ggc			624
Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly			
195	200		205
aaa aag ggt tgt aag tac ttt agt gat gat gga act ttt gtt tgt gaa			672
Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val Cys Glu			
210	215		220
gga gag tct gat cct aaa aat cca aag gct tgt cct cgg aat tgt gat			720
Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp			
225	230	235	240
gga aga att gcc tat ggg att tgc cca ctt tca gaa gaa aag aag aat			768
Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn			
245	250		255
gat cgg ata tgc aca aac tgt tgc gca ggc aaa aag ggc tgt aag tac			816
Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr			
260	265		270
ttt agt gat gat gga act ttt gtt tgt gaa gga gag tct gat cct aga			864
Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Arg			
275	280		285
aat cca aag gcc tgt cct cgg aat tgt gat gga aga att gcc tat gga			912
Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly			
290	295	300	
att tgc cca ctt tca gaa gaa aag aag aat gat cgg ata tgc acc aat			960
Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn			
305	310	315	320
tgt tgc gca ggc aag aag ggc tgt aag tac ttt agt gat gat gga act			1008
Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr			
325	330		335
ttt att tgt gaa gga gaa tct gaa tat gcc agc aaa gtg gat gaa tat			1056
Phe Ile Cys Glu Gly Glu Ser Glu Tyr Ala Ser Lys Val Asp Glu Tyr			
340	345		350
gtt ggt gaa gtg gag aat gat ctc cag aag tct aag gtt gct gtt tcc			1104
Val Gly Glu Val Glu Asn Asp Leu Gln Lys Ser Lys Val Ala Val Ser			
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 35 40 45

Cys Glu Gly Glu Ser Asp Pro Arg Asn Pro Lys Ala Cys Thr Leu Asn
 50 55 60

Cys Asp Pro Arg Ile Ala Tyr Gly Val Cys Pro Arg Ser Glu Glu Lys
 65 70 75 80

Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Thr Lys Gly Cys
 85 90 95

Lys Tyr Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp
 100 105 110

Pro Arg Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Pro Arg Ile Ala
 115 120 125

Tyr Gly Ile Cys Pro Leu Ala Glu Glu Lys Lys Asn Asp Arg Ile Cys
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Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp
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Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Lys Asn Pro Lys Ala
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Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu
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Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly
 195 200 205

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Gly Arg Ile Ala Tyr Gly Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn
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Asp Arg Ile Cys Thr Asn Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr
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Phe Ser Asp Asp Gly Thr Phe Val Cys Glu Gly Glu Ser Asp Pro Arg
275 280 285

Asn Pro Lys Ala Cys Pro Arg Asn Cys Asp Gly Arg Ile Ala Tyr Gly
290 295 300

Ile Cys Pro Leu Ser Glu Glu Lys Lys Asn Asp Arg Ile Cys Thr Asn
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Cys Cys Ala Gly Lys Lys Gly Cys Lys Tyr Phe Ser Asp Asp Gly Thr
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